

Alexander Hay
ME333 - Mechatronics
Chapter 7, 1-2
Chapter 8, 1
Chapter 9, 1
Chapter 10, 1-2

7.1 False
“if an input pin is not connected to anything, we cannot be certain what the input will read.”
pg. 116

7.2 a Pin 2 will most likely have an external pull-up resistor.
500Ω-100kΩ. At 5V, currents below 50 μA will not be read as logic high. 10mA is the most current the pin can receive at 5V. 9V 900Ω

b

```
AD1PCFG = 0x1E;
TRISBbits.TRISB1 = 0;
TRISBbits.TRISB2 = 0;
TRISBbits.TRISB3 = 1;
TRISBbits.TRISB4 = 1;
TRISB = 0x18 // does this do the same thing?

ODCBbits.ODCB1 = 0;
ODCBbits.ODCB2 = 1;
ODCBbits.ODCB3 = 0;
ODCB = 0x4;

CNPUbits.CNPU4 = 1;
CNCONbits.ON = 1;
CNENbits.CNEN3 = 1;
```

8.1 T3CON = 0x8060;
PR3 = 0x4E1F;

9.1 $f_{pwm} = 80,000 / 2^n$
 $RC = f_{pwm} / (80 \pi)$

10.1 AD1CON1bits.SRCC = 0x111;
AD1CON1bits.ASAM = 0;
AD1CON1bits.ADCS =
Tad = 6*Tpb = 75ns
Tsamp = 2*Tad = 150ns

```

10.2 unsigned int adc_sample_convert(int pin) {    // sample & convert the value
                                                    // on the given
                                                    // adc pin the pin should be
                                                    // configured as an
                                                    // analog input in AD1PCFG

    unsigned int elapsed = 0,
    finish_time = 0;
    AD1CHSbits.CH0SA = pin;    // connect chosen pin to MUXA for
                                // sampling
    elapsed = _CP0_GET_COUNT();
    finish_time = elapsed + 10; // 10 core timer ticks = 250 ns
    while (_CP0_GET_COUNT() < finish_time) {
        ;    // sample for more than 250 ns
    }
    return ADC1BUF0;    // read the buffer with the result
}

```